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GRAVITY ASSESSMENT
OF
RAZORBACK TAILS COMPOSITE SAMPLES
FOR
STELLAR RESOURCES LTD

Technical Report T1108
J R Glen
April 2018

GRAVITY ASSESSMENT OF
RAZORBACK TAILS COMPOSITE SAMPLES FOR
STELLAR RESOURCES LTD

DATE

2 April, 2018

BRIEF

- Receive and prepare core intervals of Razorback Tails to composites for testing.
- Size and perform head and fraction analyses on fractions of each composite.
- Size and perform batch gravity assessment of size fractions.
- Assess magnetic separation of concentrate.

SUMMARY

Eight samples of Razorback tails were received for analysis, sizing and size fraction analysis and batch gravity separations. Samples were made into four composites for assessment.

Head sample analyses are indicated in the following table.

Composite	Sn (%)	Fe (%)	As (%)	MgO (%)	CaO (%)	MnO (%)	SiO ₂ (%)	Al ₂ O ₃ (%)	S (%)
Comp A	0.2	19.5	0.05	9.12	0.07	1.85	45.3	3.2	0.24
Comp B	0.26	19.1	0.07	7.75	0.02	1.86	48.6	3.13	0.22
Comp C	0.27	19.7	0.12	8.00	0.02	1.76	47.2	3.23	0.37
Comp D	0.24	19.4	0.14	8.31	0.01	1.79	48.4	3.26	0.41

Size distributions for each composite and gravity separations are summarised below.

Composite		A	B	C	D	AVERAGE
p80 (um)		62	111	173	183	132
Weight Distribution	75um (%)	14	36	61	65	44
	CS1-75um (%)	19	27	20	16	21
	CS1-CS5 (%)	33	21	11	9	19
	<CS5 (%)	34	16	7	10	17
Tin Distribution	>75um (%)	6	16	38	45	26
	CS1-75um (%)	27	48	45	37	39
	CS1-CS5 (%)	53	30	15	16	29
	<CS5 (%)	14	6	2	2	6
Gravity Conc Grade Sn (%)		30.7	23.3	29.2	25.7	27.2
Gravity Conc Recovery Sn (%)		43.6	45.9	36.7	32.4	39.7

Results indicate size and tin distributions vary widely between composites with an average p80=132um. Significantly there is very little tin in the sub CS5 fraction, containing on average 6% of feed tin and 17% of mass.

Gravity separations were performed on >150um, >75um and >CS1 fractions. Separations from >75um are poor throughout. Separations of the >CS1 fraction (30 to 75um) are good with significant upgrade (23-30%Sn) and recovery (60-78%) from that fraction.

Averaged results indicate a gravity concentrate of 27.2%Sn at 39.7% recovery from new feed.

A Davis Tube test of a combined concentrate indicates that no magnetite is present.

MATERIAL TESTED

The following sample intervals were received for testing:

SZ000203, 204

SZ000207, 208

SZ000216, 217

SZ000218, 219

1kg of each was used to generate the four composites:

Composite A: SZ000203 + 204

Composite B: SZ000207 + 208

Composite C: SZ000216 + 217

Composite D: SZ000218 + 219

TEST ROUTINES

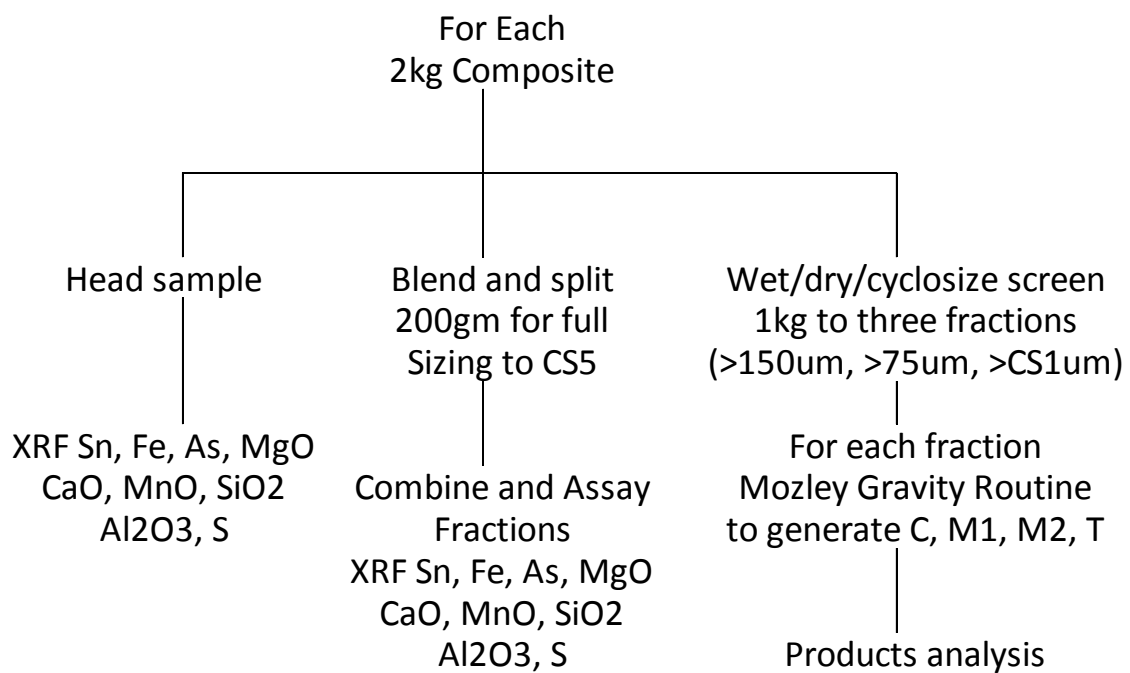
Stellar: Razorback

STAGE: Composites Preparation

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Generate Four Composites

- A. SZ000203 + 204 (1kg from each)
- B. SZ000207 + 208 (1kg from each)
- C. SZ000216 + 217 (1kg from each)
- D. SZ000218 + 219 (1kg from each)



RESULTS

HEAD SAMPLE ANALYSES

Product Description	ME-XRF15d	Sn (%)	Fe (%)	As (%)	MgO (%)	CaO (%)	MnO (%)	SiO2 (%)	Al2O3 (%)	S (%)
Comp A Head	1108007	0.2	19.5	0.05	9.12	0.07	1.85	45.3	3.2	0.24
Comp B Head	1108014	0.26	19.1	0.07	7.75	0.02	1.86	48.6	3.13	0.22
Comp C Head	1108021	0.27	19.7	0.12	8.00	0.02	1.76	47.2	3.23	0.37
Comp D Head	1108028	0.24	19.4	0.14	8.31	0.01	1.79	48.4	3.26	0.41

Size distributions of each composite and gravity separations are summarised below.

SUMMARY

Composite		A	B	C	D	AVERAGE
%Sn (%)		0.21	0.25	0.27	0.22	0.24
%Fe (%)		20.0	19.1	19.8	19.1	19.5
%SiO2 (%)		44.9	48.7	47.6	48.4	47.4
p80 (um)		62	111	173	183	132
Weight Distribution	75um (%)	14	36	61	65	44
	CS1-75um (%)	19	27	20	16	21
	CS1-CS5 (%)	33	21	11	9	19
	<CS5 (%)	34	16	7	10	17
Tin Distribution	>75um (%)	6	16	38	45	26
	CS1-75um (%)	27	48	45	37	39
	CS1-CS5 (%)	53	30	15	16	29
	<CS5 (%)	14	6	2	2	6
Gravity Conc Grade Sn (%)		30.7	23.3	29.2	25.7	27.2
Gravity Conc Recovery Sn (%)		43.6	45.9	36.7	32.4	39.7

Results indicate that size and tin distributions vary widely between composites. Composite A is the finest (p80=62um) and Composite D the coarsest (p80=183).

Significantly there is very little tin in sub CS5, around 8um, this fraction contains on average 6% of feed tin and 17% of mass.

Gravity separations indicate in all cases that there is no significant tin separation above 75um. This fraction contains on average 26% of feed tin units. The separations between CS1 and 75um are good with significant upgrade (23-30%Sn) and recovery (60-78%) from that fraction.

Average results indicate a gravity concentrate of 27.2%Sn at 39.7% recovery from new feed. A Davis tube separation of a combined concentrate indicates insignificant magnetics content.

AS RECEIVED TAILS SIZINGS

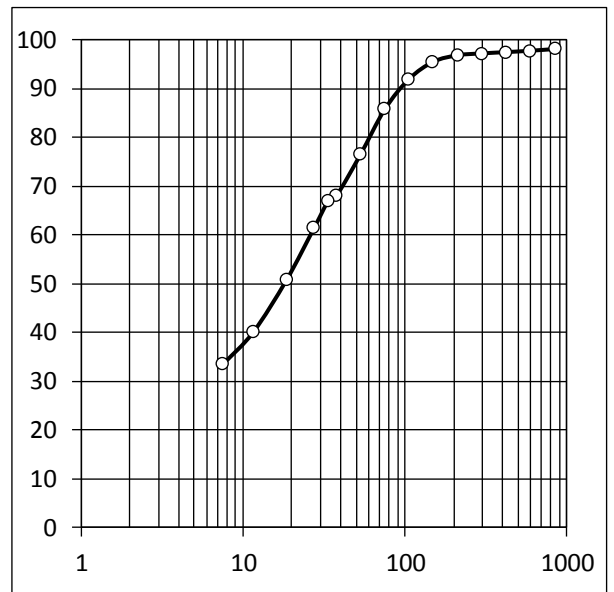


BURNIE LABORATORY

SIZE ANALYSIS REPORT SHEET WITH <CS5 ASSAY

PROJECT	T1108
TEST	
NAME	Comp A
DATE	210218
TECHNICIAN	TK-W

Product Sized Comp A		SIZE um	WEIGHTS		
			g	(%)	%PASS
p80		850	3.85	1.97	98.0
		600	0.69	0.35	97.7
		425	0.56	0.29	97.4
		300	0.51	0.26	97.1
		212	0.75	0.38	96.7
		150	2.56	1.31	95.4
		106	6.91	3.54	91.9
		75	12.16	6.23	85.7
62		53	18.17	9.31	76.4
		38	16.13	8.26	68.1
CYCLOSIZER	CS1	34	2.22	1.14	67.0
FLOW 185	CS2	28	10.57	5.41	61.5
TEMP 21	CS3	19	21.09	10.80	50.7
SG 2.50	CS4	12	20.98	10.75	40.0
MINS 20	CS5	8	12.77	6.54	33.5
<CS5		65.32	33.46	0.0	
TOTAL		195.24	100.00		



ANALYSES

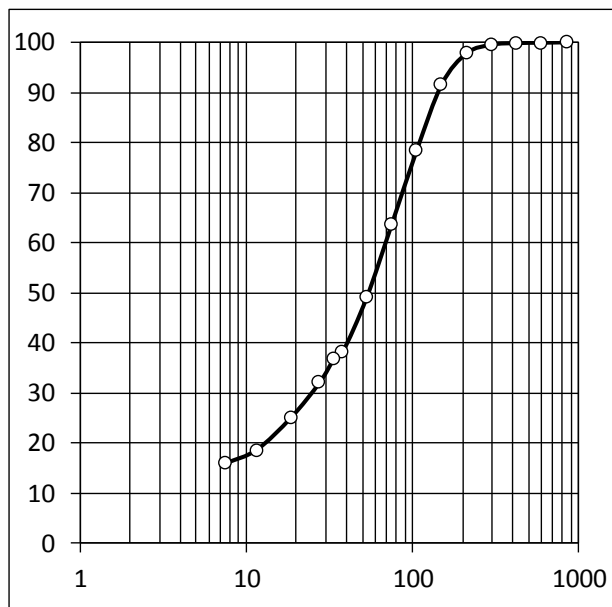
SIZE um	WT %	Sn		Fe		As		MgO		CaO		MnO	
		%	dist	%	dist	%	dist	%	dist	%	dist	%	dist
150	4.57	0.10	2.19	12.7	2.89	0.05	4.43	7.59	3.78	0.12	8.83	7.72	19.1
75	9.77	0.09	4.21	14.4	7.04	0.05	9.46	7.98	8.50	0.04	6.29	1.69	8.94
34	18.7	0.30	26.9	19.2	18.0	0.05	18.1	8.15	16.6	0.04	12.0	1.89	19.2
19	16.2	0.45	34.9	23.0	18.7	0.06	18.8	6.54	11.6	0.05	13.1	1.81	15.9
8	17.3	0.21	17.4	19.1	16.5	0.05	16.7	10.7	20.1	0.06	16.7	1.19	11.1
<8	33.5	0.09	14.4	22.1	37.0	0.05	32.4	10.8	39.4	0.08	43.1	1.42	25.7
Calc	100.0	0.21	100.0	20.0	100.0	0.05	100.0	9.17	100.0	0.06	100.0	1.85	100.0
Assay		0.20		19.5		0.05		9.12		0.07		1.85	

ANALYSES

SIZE um	WT %	SiO2		Al2O3		S	
		%	dist	%	dist	%	dist
150	4.57	39.9	4.06	3.00	4.14	0.13	3.01
75	9.77	56.1	12.2	3.13	9.23	0.11	5.45
34	18.7	49.1	20.4	2.64	14.9	0.30	28.4
19	16.2	43.5	15.7	2.67	13.1	0.38	31.2
8	17.3	47.3	18.2	2.42	12.6	0.17	14.9
<8	33.5	39.5	29.4	4.56	46.0	0.10	17.0
Calc	100.0	44.9	100.0	3.31	100.0	0.20	100.0
Assay		45.3		3.20		0.24	

PROJECT	T1108
TEST	
NAME	Comp B
DATE	210218
TECHNICIAN	TK-W

Product Sized Comp B		SIZE um	WEIGHTS		
			g	(%)	%PASS
p80		850	0.22	0.11	99.9
		600	0.17	0.08	99.8
		425	0.15	0.07	99.7
		300	0.63	0.31	99.4
		212	3.38	1.67	97.7
		150	12.45	6.16	91.6
		106	26.66	13.20	78.4
		75	29.85	14.78	63.6
111		53	29.58	14.65	49.0
		38	22.01	10.90	38.1
CYCLOSIZER	CS1	34	2.77	1.37	36.7
FLOW 185	CS2	28	9.48	4.69	32.0
TEMP 21	CS3	19	14.17	7.02	25.0
SG 2.50	CS4	12	13.00	6.44	18.5
MINS 20	CS5	8	5.44	2.69	15.9
<CS5			32.02	15.85	0.0
TOTAL			201.98	100.00	



ANALYSES

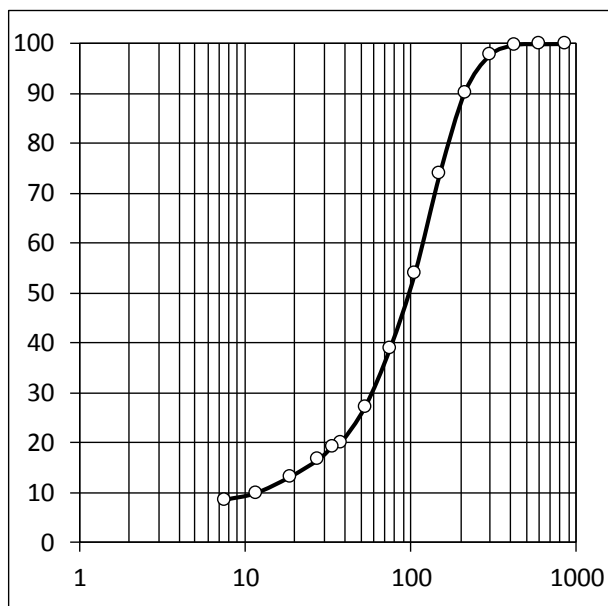
SIZE um	WT %	Sn		Fe		As		MgO		CaO		MnO	
		%	dist	%	dist	%	dist	%	dist	%	dist	%	dist
150	8.42	0.09	2.99	10.9	4.80	0.05	6.24	6.42	6.90	0.03	5.94	1.35	6.20
75	28.0	0.12	13.3	15.5	22.6	0.05	20.7	7.16	25.6	0.03	19.7	1.53	23.4
34	26.9	0.45	47.8	22.2	31.3	0.09	35.9	6.43	22.1	0.04	25.3	2.49	36.6
19	11.7	0.50	23.1	23.2	14.2	0.08	13.9	6.42	9.60	0.05	13.8	2.13	13.6
8	9.13	0.20	7.21	19.1	9.12	0.05	6.77	10.9	12.7	0.06	12.9	1.39	6.93
<8	15.9	0.09	5.63	21.7	18.0	0.07	16.5	11.4	23.1	0.06	22.4	1.54	13.3
Calc	100.0	0.25	100.0	19.1	100.0	0.07	100.0	7.83	100.0	0.04	100.0	1.83	100.0
Assay		0.26		19.1		0.07		7.75		0.02		1.86	

ANALYSES

SIZE um	WT %	SiO2		Al2O3		S	
		%	dist	%	dist	%	dist
150	8.42	62.6	10.8	4.19	11.1	0.08	3.14
75	28.0	56.0	32.2	3.39	29.9	0.10	13.0
34	26.9	45.0	24.9	2.52	21.4	0.37	46.4
19	11.7	43.3	10.4	2.48	9.16	0.36	19.6
8	9.13	47.5	8.91	2.24	6.45	0.21	8.93
<8	15.9	39.3	12.8	4.40	22.0	0.12	8.86
Calc	100.0	48.7	100.0	3.17	100.0	0.21	100.0
Assay		48.6		3.13		0.22	

PROJECT	T1108
TEST	
NAME	Comp C
DATE	210218
TECHNICIAN	TK-W

Product Sized Comp C		SIZE um	WEIGHTS		
			g	(%)	%PASS
p80	173	850	0.09	0.05	100.0
		600	0.12	0.06	99.9
		425	0.31	0.16	99.7
		300	3.93	2.03	97.7
		212	14.33	7.41	90.3
		150	31.40	16.23	74.1
		106	38.73	20.02	54.1
		75	29.21	15.10	39.0
		53	22.64	11.70	27.3
		38	13.77	7.12	20.1
CYCLOSIZER	CS1	34	1.69	0.87	19.3
FLOW 185	CS2	28	5.01	2.59	16.7
TEMP 21	CS3	19	6.74	3.48	13.2
SG 2.50	CS4	12	6.26	3.24	10.0
MINS 20	CS5	8	2.52	1.30	8.7
<CS5			16.75	8.66	0.0
TOTAL			193.50	100.00	



ANALYSES

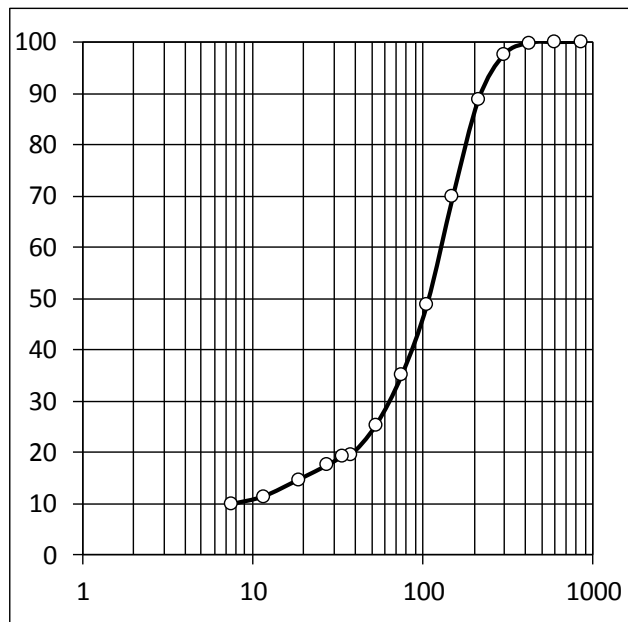
SIZE um	WT %	Sn		Fe		As		MgO		CaO		MnO	
		%	dist	%	dist	%	dist	%	dist	%	dist	%	dist
150	25.9	0.15	14.5	15.5	20.3	0.12	23.3	7.14	23.1	0.04	26.7	1.42	21.0
75	35.1	0.18	23.6	21.0	37.1	0.14	36.7	6.84	30.0	0.03	27.1	2.03	40.6
34	19.7	0.61	44.9	23.6	23.4	0.15	22.1	7.19	17.7	0.04	20.3	2.31	25.9
19	6.07	0.53	12.0	22.4	6.85	0.15	6.81	8.24	6.25	0.05	7.81	1.64	5.67
8	4.54	0.18	3.05	17.1	3.90	0.10	3.39	13.8	7.82	0.06	7.00	0.94	2.43
<8	8.66	0.06	1.94	19.4	8.44	0.12	7.76	14.1	15.2	0.05	11.1	0.89	4.39
Calc	100.0	0.27	100.0	19.8	100.0	0.13	100.0	8.01	100.0	0.04	100.0	1.76	100.0
Assay		0.27		19.7		0.12		8.00		0.02		1.76	

ANALYSES

SIZE um	WT %	SiO2		Al2O3		S	
		%	dist	%	dist	%	dist
150	25.9	56.8	31.0	4.03	31.9	0.10	7.61
75	35.1	47.4	35.0	3.15	33.8	0.27	27.8
34	19.7	39.8	16.5	2.56	15.4	0.75	43.3
19	6.07	42.6	5.44	2.67	4.96	0.63	11.2
8	4.54	47.6	4.54	2.20	3.05	0.33	4.40
<8	8.66	41.8	7.61	4.10	10.8	0.22	5.59
Calc	100.0	47.6	100.0	3.27	100.0	0.34	100.0
Assay		47.2		3.23		0.37	

PROJECT	T1108
TEST	
NAME	Comp D
DATE	210218
TECHNICIAN	TK-W

Product Sized Comp D		SIZE um	WEIGHTS		
			g	(%)	%PASS
p80	183	850	0.11	0.06	99.9
		600	0.09	0.05	99.9
		425	0.25	0.13	99.8
		300	4.43	2.25	97.5
		212	17.30	8.78	88.7
		150	37.15	18.86	69.9
		106	41.23	20.93	48.9
		75	27.44	13.93	35.0
		53	19.13	9.71	25.3
		38	11.34	5.76	19.5
CYCLOSIZER	CS1	34	0.77	0.39	19.2
FLOW 185	CS2	28	3.15	1.60	17.6
TEMP 21	CS3	19	5.69	2.89	14.7
SG 2.50	CS4	12	6.42	3.26	11.4
MINS 20	CS5	8	2.93	1.49	9.9
		<CS5	19.54	9.92	0.0
		TOTAL	196.97	100.00	



ANALYSES

SIZE um	WT %	Sn		Fe		As		MgO		CaO		MnO	
		%	dist	%	dist	%	dist	%	dist	%	dist	%	dist
150	30.1	0.13	17.7	14.4	22.7	0.10	25.4	7.10	25.3	0.02	17.8	1.36	23.8
75	34.9	0.17	26.8	21.3	38.9	0.13	38.3	6.92	28.5	0.03	30.9	2.14	43.3
34	15.9	0.52	37.3	23.5	19.5	0.13	17.4	7.84	14.7	0.04	18.7	2.43	22.4
19	4.49	0.59	12.0	23.4	5.50	0.15	5.69	8.83	4.68	0.06	7.95	1.64	4.27
8	4.75	0.19	4.07	16.4	4.08	0.12	4.81	15.3	8.55	0.03	4.20	0.76	2.09
<8	9.92	0.05	2.24	18.0	9.32	0.10	8.38	15.6	18.3	0.07	20.5	0.74	4.26
Calc	100.0	0.22	100.0	19.1	100.0	0.12	100.0	8.46	100.0	0.03	100.0	1.72	100.0
Assay		0.24		19.4		0.14		8.31		0.01		1.79	

ANALYSES

SIZE um	WT %	SiO2		Al2O3		S	
		%	dist	%	dist	%	dist
150	30.1	57.1	35.6	4.21	38.3	0.13	10.1
75	34.9	46.4	33.5	3.13	33.0	0.38	34.3
34	15.9	40.8	13.4	2.40	11.5	0.87	35.8
19	4.49	40.6	3.77	2.52	3.42	0.77	8.95
8	4.75	49.4	4.85	2.00	2.87	0.42	5.17
<8	9.92	43.3	8.89	3.66	11.0	0.22	5.65
Calc	100.0	48.3	100.0	3.31	100.0	0.39	100.0
Assay		48.4		3.26		0.41	

MOZLEY TABLE GRAVITY SEPARATIONS SUMMARY

Individual fraction separations are indicated below, the test data section indicates the overall separation grades and recoveries.

PRODUCT COMP A	Wt (%)	Sn (%)	Dist (%)	Cum Dist 0.0	Units .0	Cum
>75 Conc	3.06	0.29	11.4	11.4	39.4	39.4
Mids 1	8.99	0.24	27.7	39.2	115.6	155.0
Mids 2	30.26	0.08	31.1	70.3	389.3	544.3
Tail	57.70	0.04	29.7	100.0	742.4	1286.6
	100.00	0.08	100.0			

PRODUCT COMP A	Wt (%)	Sn (%)	Dist (%)	Cum Dist 0.0	Units 1.0	Cum
>CS1 Conc	0.54	30.7	60.3	60.3	2.0	2.0
Mids 1	17.11	0.36	22.3	82.6	62.0	64.0
Mids 2	16.91	0.09	5.5	88.1	61.3	125.3
Tail	65.44	0.05	11.9	100.0	237.2	362.5
	100.00	0.28	100.0			

PRODUCT COMP B	Wt (%)	Sn (%)	Dist (%)	Cum Dist	Units	Cum
>75 Conc	1.59	0.57	7.57	7.57	13.3	13.3
Mids 1	14.9	0.29	36.2	43.7	124.8	138.0
Mids 2	34.2	0.11	31.5	75.3	286.5	424.5
Tail	49.3	0.06	24.7	100.0	412.3	836.9
	100.0	0.12	100.0			

PRODUCT COMP B	Wt (%)	Sn (%)	Dist (%)	Cum Dist	Units	Cum
>CS1 Conc	1.12	23.3	63.7	63.7	2.73	2.73
Mids 1	9.91	0.50	12.1	75.7	24.1	26.8
Mids 2	23.5	0.23	13.1	88.8	57.1	83.9
Tail	65.5	0.07	11.2	100.0	159.3	243.2
	100.0	0.41	100.0			

PRODUCT COMP C	Wt (%)	Sn (%)	Dist (%)	Cum Dist 0	Units 0	Cum 0
>150 Conc	1.45	0.50	5.11	5.11	10.2	10.2
Mids 1	6.46	0.36	16.4	21.5	45.4	55.6
Mids 2	41.2	0.16	46.3	67.8	289.5	345.1
Tail	50.9	0.09	32.2	100.0	358.0	703.1
	100.0	0.14	100.0			
PRODUCT COMP C	Wt (%)	Sn (%)	Dist (%)	Cum Dist 0	Units 0	Cum 0
>75 Conc	1.58	1.48	13.2	13.2	8.93	8.93
Mids 1	16.3	0.34	31.4	44.6	92.3	101.2
Mids 2	24.8	0.21	29.4	74.0	140.2	241.4
Tail	57.3	0.08	26.0	100.0	324.6	566.0
	100.0	0.18	100.0			
PRODUCT COMP C	Wt (%)	Sn (%)	Dist (%)	Cum Dist 0	Units 0	Cum 0
>CS1 Conc	1.37	29.2	67.2	67.2	7.74	7.74
Mids 1	19.5	0.60	19.6	86.9	110.1	117.9
Mids 2	20.3	0.21	7.18	94.1	115.1	232.9
Tail	58.8	0.06	5.94	100.0	333.1	566.0
	100.0	0.59	100.0			

PRODUCT COMP D	Wt (%)	Sn (%)	Dist (%)	Cum Dist 0	Units 0	Cum 0
>150 Conc	0.94	0.65	4.34	4.34	6.7	6.7
Mids 1	10.07	0.31	22.1	26.5	71.4	78.1
Mids 2	21.0	0.17	25.3	51.7	148.7	226.8
Tail	68.0	0.10	48.3	100.0	482.5	709.3
	100.0	0.14	100.0			
PRODUCT COMP D	Wt (%)	Sn (%)	Dist (%)	Cum Dist 0	Units 0	Cum 0
>75 Conc	1.12	1.77	10.6	10.6	6.00	6.00
Mids 1	11.3	0.43	26.0	36.6	60.5	66.5
Mids 2	19.0	0.26	26.5	63.1	101.8	168.3
Tail	68.7	0.10	36.9	100.0	369.0	537.3
	100.0	0.19	100.0			
PRODUCT COMP D	Wt (%)	Sn (%)	Dist (%)	Cum Dist 0	Units 0	Cum 0
>CS1 Conc	1.58	25.7	67.9	67.9	8.48	8.48
Mids 1	22.8	0.50	19.1	87.0	122.5	131.0
Mids 2	22.3	0.18	6.74	93.8	120.1	251.1
Tail	53.3	0.07	6.24	100.0	286.2	537.3
	100.0	0.60	100.0			

DAVIS TUBE SEPARATION

A Davis Tube magnetic separation of a combined gravity concentrate does not indicate the presence of a magnetic iron fraction.

Combined Gravity Conc	
Electric Current (A)	1.4
Water Flow (mls/min)	540
Run Time (min)	15
Sample Start Weight (g)	9.93
Magnetics Weight (g)	0.24
Non-magnetics Weight (g)	9.69
Magnetics Weight (%)	2.42

TEST DATA

TEST TYPE	Gravity
Stage 1	Wet size to fractions to <150 >75um
Stage 2	Wet size to fractions to <75 >CS1
Stage 3	Gravity separation each fraction by Mozley table

PROJECT	T1108
TEST NO	T01
DATE	20318
TECH	ID

START MATERIAL Comp A	
START WT (gm)	455.4
FROM TEST NO	

GRAVITY SEPARATION RESULTS

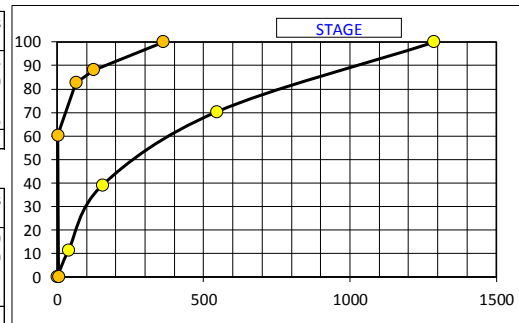
Product	Wt (gm)	Calc (gm)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	As (%)	Dist (%)	MgO (%)	Dist (%)	CaO (%)	Dist (%)
>150	14.5	14.51	4.57	0.10	2.5	12.7	3.01	0.05	3.32	7.59	3.58	0.12	5.68
>75 Conc	2.72	2.72	0.60	0.29	1.0	47.4	1.47	0.17	1.47	0.68	0.04	0.70	4.33
Mids 1	7.99	7.99	1.75	0.24	2.3	32.9	2.99	0.14	3.56	2.53	0.46	0.12	2.18
Mids 2	26.9	26.9	5.91	0.08	2.6	11.1	3.40	0.05	4.29	7.35	4.49	0.05	3.06
Tail	51.3	51.3	11.3	0.04	2.5	10.3	6.01	0.05	8.17	9.77	11.4	0.09	10.5
>CS1 Conc	1.16	1.16	0.25	30.7	43.6	16.0	0.21	0.32	1.18	2.21	0.06	0.74	1.95
Mids 1	36.6	36.6	8.04	0.36	16.1	44.5	18.6	0.19	22.2	1.07	0.89	0.14	11.7
Mids 2	36.2	36.2	7.95	0.09	4.0	18.3	7.52	0.08	9.23	4.98	4.09	0.09	7.41
Tail	140.1	140.1	30.8	0.05	8.6	11.6	18.5	0.05	22.3	11.9	37.7	0.08	25.5
<CS1	152.4	152.4	33.5	0.09	16.8	22.1	38.3	0.05	24.3	10.8	37.3	0.08	27.7
Total	455.4	455.4	100.0	0.18	100.0	19.3	100.0	0.07	100.0	9.68	100.0	0.10	100.0
Head				0.20		19.5		0.05		9.12		0.07	

Product	MnO (%)	Dist (%)	SiO2 (%)	Dist (%)	Al2O3 (%)	Dist (%)	S (%)	Dist (%)
>150	7.72	17.94	39.9	0.60	3.00	3.87	0.13	3.28
>75 Conc	5.48	1.66	5.92	0.07	1.66	0.28	0.49	1.62
Mids 1	3.21	2.86	28.7	1.00	3.72	1.84	0.18	1.74
Mids 2	1.11	3.33	64.7	7.59	3.59	5.99	0.05	1.63
Tail	1.36	7.79	62.5	14.0	3.02	9.6	0.09	5.60
>CS1 Conc	4.48	0.58	1.28	0.01	2.29	0.16	5.55	7.81
Mids 1	4.86	19.9	9.97	1.59	2.07	4.71	0.96	42.7
Mids 2	1.52	6.14	55.0	8.68	3.31	7.44	0.12	5.27
Tail	1.00	15.6	60.9	37.2	2.64	23.0	0.07	11.9
<CS1	1.42	24.2	39.50	26.2	4.56	43.1	0.10	18.5
Total	1.97	100.0	50.4	97.0	3.54	100.0	0.2	100.0
Head	1.85		45.3		3.20		0.24	

GRAVITY SEPARATIONS COMP A

PRODUCT COMP A	Wt (%)	Sn (%)	Dist (%)	Cum Dist	Units	Cum Units
>75 Conc	3.06	0.29	11.4	11.4	39.4	39.4
Mids 1	8.99	0.24	27.7	39.2	115.6	155.0
Mids 2	30.26	0.08	31.1	70.3	389.3	544.3
Tail	57.70	0.04	29.7	100.0	742.4	1286.6
	100.00	0.08	100.0			

PRODUCT COMP A	Wt (%)	Sn (%)	Dist (%)	Cum Dist	Units	Cum Units
>CS1 Conc	0.54	30.7	60.3	60.3	2.0	2.0
Mids 1	17.11	0.36	22.3	82.6	62.0	64.0
Mids 2	16.91	0.09	5.5	88.1	61.3	125.3
Tail	65.44	0.05	11.9	100.0	237.2	362.5
	100.00	0.28	100.0			



TEST TYPE	Gravity
Stage 1	Wet size to fractions to <150 >75um
Stage 2	Wet size to fractions to <75 >CS1um
Stage 3	Gravity separation each fraction by Mozley table

PROJECT	T1108
TEST NO	T02
DATE	20318
TECH	ID

START MATERIAL Comp B	
START WT (gm)	672.9
FROM TEST NO	

GRAVITY SEPARATION RESULTS

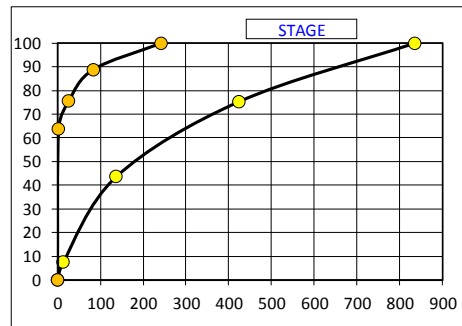
Product	Wt (gm)	Calc (gm)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	As (%)	Dist (%)	MgO (%)	Dist (%)	CaO (%)	Dist (%)
>150	27.1	27.11	4.57	0.09	1.7	10.9	2.56	0.05	2.72	6.42	3.70	0.03	3.42
>75 Conc	4.42	4.42	0.66	0.57	1.54	44.6	1.51	0.15	1.17	0.92	0.08	0.07	1.15
Mids 1	41.5	41.5	6.17	0.29	7.35	39.0	12.4	0.21	15.4	2.02	1.57	0.03	4.62
Mids 2	95.4	95.4	14.2	0.11	6.40	13.6	9.9	0.05	8.44	7.27	13.0	0.03	10.6
Tail	137.3	137.3	20.4	0.06	5.03	9.08	9.53	0.05	12.2	8.91	22.9	0.03	15.3
>CS1 Conc	3.23	3.23	0.48	23.3	45.9	17.3	0.43	0.23	1.31	2.72	0.16	0.18	2.16
Mids 1	28.5	28.5	4.24	0.50	8.70	41.3	8.99	0.08	4.04	0.76	0.41	0.01	1.06
Mids 2	67.5	67.5	10.0	0.23	9.47	35.6	18.4	0.18	21.5	2.22	2.81	0.04	10.0
Tail	188.3	188.3	28.0	0.07	8.04	13.0	18.6	0.06	20.0	9.21	32.5	0.04	27.9
<CS1	106.7	106.7	15.9	0.09	5.86	21.7	17.7	0.07	13.2	11.4	22.8	0.06	23.7
Total	672.9	672.9	100.0	0.24	100.0	19.4	100.0	0.08	100.0	7.93	100.0	0.04	100.0
Head				0.26		19.1		0.07		7.75		0.02	

Product	MnO (%)	Dist (%)	SiO2 (%)	Dist (%)	Al2O3 (%)	Dist (%)	S (%)	Dist (%)
>150	1.35	3.23	62.6	1.05	4.19	5.60	0.08	1.84
>75 Conc	8.65	2.97	3.80	0.05	1.74	0.33	1.26	4.17
Mids 1	4.12	13.3	19.5	2.30	2.88	5.20	0.26	8.08
Mids 2	1.09	8.09	59.9	16.3	4.02	16.7	0.09	6.42
Tail	0.77	8.22	67.8	26.5	3.38	20.2	0.04	4.11
>CS1 Conc	7.86	1.97	1.18	0.01	3.00	0.42	5.15	12.4
Mids 1	6.93	15.4	2.98	0.24	1.30	1.61	1.26	26.9
Mids 2	3.56	18.7	26.1	5.01	2.56	7.52	0.33	16.7
Tail	1.05	15.4	60.2	32.2	2.69	22.0	0.07	9.9
<CS1	1.54	12.8	39.3	11.9	4.40	20.4	0.12	9.57
Total	1.91	100.0	52.2	95.6	3.42	100.0	0.2	100.0
Head	1.86		48.6		3.13		0.22	

GRAVITY SEPARATION COMPOSITE B

PRODUCT COMP B	Wt (%)	Sn (%)	Dist (%)	Cum Dist	Units	Cum Units
>75 Conc	1.59	0.57	7.57	7.57	13.3	13.3
Mids 1	14.9	0.29	36.2	43.7	124.8	138.0
Mids 2	34.2	0.11	31.5	75.3	286.5	424.5
Tail	49.3	0.06	24.7	100.0	412.3	836.9
	100.0	0.12	100.0			

PRODUCT COMP B	Wt (%)	Sn (%)	Dist (%)	Cum Dist	Units	Cum Units
>CS1 Conc	1.12	23.3	63.7	63.7	2.73	2.73
Mids 1	9.91	0.50	12.1	75.7	24.1	26.8
Mids 2	23.5	0.23	13.1	88.8	57.1	83.9
Tail	65.5	0.07	11.2	100.0	159.3	243.2
	100.0	0.41	100.0			



TEST TYPE	Gravity
Stage 1	Wet size to fractions to >150
Stage 2	Wet size to fractions to <150 >75um
Stage 3	Wet size to fractions to <75 >CS1um
Stage 4	Gravity separation each fraction by Mozley table

PROJECT	T1108
TEST NO	T03
DATE	20318
TECH	ID

START MATERIAL Comp C	
START WT (gm)	888.9
FROM TEST NO	

GRAVITY SEPARATION RESULTS

Product	Wt (gm)	Calc (gm)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	As (%)	Dist (%)	MgO (%)	Dist (%)	CaO (%)	Dist (%)
>150 Conc	4.07	4.07	0.46	0.50	0.91	45.7	1.08	0.21	1.04	0.99	0.06	0.12	1.33
Mids 1	18.1	18.1	2.04	0.36	2.90	39.7	4.18	0.18	3.95	2.77	0.73	0.03	1.47
Mids 2	115.3	115.3	13.0	0.16	8.22	16.9	11.3	0.05	6.99	7.78	13.1	0.02	6.26
Tail	142.6	142.6	16.0	0.09	5.72	10.1	8.35	0.05	8.65	6.91	14.4	0.01	3.87
>75 Conc	5.14	5.14	0.58	1.48	3.39	36.8	1.10	0.11	0.69	1.95	0.15	0.06	0.84
Mids 1	53.1	53.1	5.97	0.34	8.04	40.2	12.4	0.19	12.2	0.88	0.68	0.03	4.33
Mids 2	80.7	80.7	9.08	0.21	7.55	26.4	12.4	0.14	13.7	5.71	6.74	0.10	21.9
Tail	186.8	186.8	21.0	0.08	6.66	11.2	12.1	0.05	11.3	9.35	25.5	0.04	20.3
>CS1 Conc	2.82	2.82	0.32	29.2	36.7	16.6	0.27	0.45	1.54	2.43	0.10	0.21	1.61
Mids 1	40.1	40.1	4.51	0.60	10.7	45.7	10.7	0.21	10.2	1.02	0.60	0.05	5.45
Mids 2	41.9	41.9	4.71	0.21	3.92	35.8	8.74	0.19	9.65	3.04	1.86	0.05	5.69
Tail	121.3	121.3	13.6	0.06	3.24	12.3	8.65	0.06	8.83	11.4	20.2	0.05	16.5
<CS1	77.0	77.0	8.66	0.06	2.06	19.4	8.67	0.12	11.2	14.1	15.8	0.05	10.5
Total	888.9	888.9	100.0	0.25	100.0	19.3	100.0	0.09	100.0	7.70	100.0	0.04	100.0
Head				0.27		19.7		0.12		8.00		0.02	

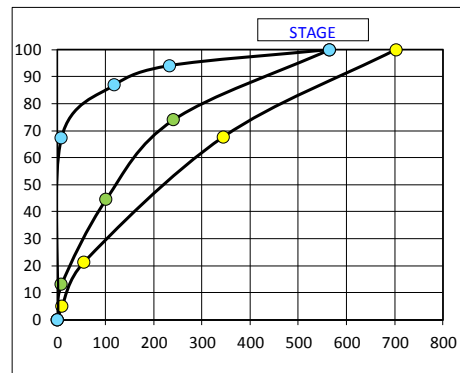
Product	MnO (%)	Dist (%)	SiO2 (%)	Dist (%)	Al2O3 (%)	Dist (%)	S (%)	Dist (%)
>150 Conc	7.13	1.89	7.57	0.07	1.64	0.22	0.69	1.00
Mids 1	4.29	5.05	17.6	0.75	2.80	1.66	0.26	1.68
Mids 2	1.38	10.3	52.6	14.2	4.04	15.3	0.08	3.30
Tail	0.84	7.79	60.3	20.2	3.88	18.1	0.04	2.04
>75 Conc	9.27	3.10	2.73	0.03	3.26	0.55	4.37	8.02
Mids 1	4.68	16.2	6.17	0.77	1.42	2.47	0.61	11.6
Mids 2	2.15	11.3	40.8	7.73	4.04	10.7	0.27	7.78
Tail	0.76	9.23	64.6	28.3	3.71	22.7	0.15	10.0
>CS1 Conc	4.61	0.85	1.20	0.01	2.60	0.24	7.53	7.59
Mids 1	6.10	15.9	3.80	0.36	1.70	2.23	2.23	31.9
Mids 2	2.85	7.77	27.6	2.71	3.00	4.12	0.37	5.54
Tail	0.78	6.15	60.8	17.3	2.87	11.4	0.08	3.47
<CS1	0.89	4.46	41.8	7.55	4.10	10.3	0.22	6.05
Total	1.73	100.0	47.9	100.0	3.43	100.0	0.31	100.0
Head	1.76		47.2		3.23		0.37	

GRAVITY SEPARATION COMPOSITE C

PRODUCT	Wt (%)	Sn (%)	Dist (%)	Cum Dist	Units	Cum Units
COMP C						
>150 Conc	1.45	0.50	5.11	5.11	10.2	10.2
Mids 1	6.46	0.36	16.4	21.5	45.4	55.6
Mids 2	41.2	0.16	46.3	67.8	289.5	345.1
Tail	50.9	0.09	32.2	100.0	358.0	703.1
	100.0	0.14	100.0			

PRODUCT	Wt (%)	Sn (%)	Dist (%)	Cum Dist	Units	Cum Units
COMP C						
>75 Conc	1.58	1.48	13.2	13.2	8.93	8.93
Mids 1	16.3	0.34	31.4	44.6	92.3	101.2
Mids 2	24.8	0.21	29.4	74.0	140.2	241.4
Tail	57.3	0.08	26.0	100.0	324.6	566.0
	100.0	0.18	100.0			

PRODUCT	Wt (%)	Sn (%)	Dist (%)	Cum Dist	Units	Cum Units
COMP C						
>CS1 Conc	1.37	29.2	67.2	67.2	7.74	7.74
Mids 1	19.5	0.60	19.6	86.9	110.1	117.9
Mids 2	20.3	0.21	7.18	94.1	115.1	232.9
Tail	58.8	0.06	5.94	100.0	333.1	566.0
	100.0	0.59	100.0			



TEST TYPE	Gravity
Stage 1	Wet size to fractions to >150
Stage 2	Wet size to fractions to <150 >75um
Stage 3	Wet size to fractions to <75 >CS1um
Stage 4	Gravity separation each fraction by Mozley table

PROJECT	T1108
TEST NO	T04
DATE	20318
TECH	ID

START MATERIAL Comp D	
START WT (gm)	913.7
FROM TEST NO	

GRAVITY SEPARATION RESULTS

Product	Wt (gm)	Calc (gm)	Wt (%)	Sn (%)	Dist (%)	Fe (%)	Dist (%)	As (%)	Dist (%)	MgO (%)	Dist (%)	CaO (%)	Dist (%)
>150 Conc	3.17	3.17	0.35	0.65	0.97	43.7	0.79	0.18	0.71	1.04	0.05	0.07	0.52
Mids 1	33.9	33.9	3.71	0.31	4.96	34.4	6.67	0.17	7.16	4.03	1.88	0.04	3.20
Mids 2	70.6	70.6	7.73	0.17	5.66	17.2	6.92	0.09	7.89	7.69	7.45	0.11	18.3
Tail	229.1	229.1	25.1	0.10	10.8	11.0	14.3	0.05	14.2	7.17	22.6	0.03	16.2
>75 Conc	3.54	3.54	0.39	1.77	2.95	34.7	0.70	0.13	0.57	2.48	0.12	0.04	0.33
Mids 1	35.7	35.7	3.91	0.43	7.24	46.8	9.55	0.19	8.42	0.86	0.42	0.03	2.53
Mids 2	60.1	60.1	6.58	0.26	7.37	35.4	12.2	0.17	12.7	3.51	2.90	0.03	4.26
Tail	217.8	217.8	23.8	0.10	10.3	13.3	16.6	0.05	13.5	9.03	27.0	0.05	25.7
>CS1 Conc	2.67	2.67	0.29	25.7	32.4	18.1	0.28	0.36	1.19	2.55	0.09	0.19	1.20
Mids 1	38.6	38.6	4.22	0.50	9.09	45.4	10.0	0.17	8.14	1.02	0.54	0.03	2.73
Mids 2	37.8	37.8	4.14	0.18	3.21	32.3	6.98	0.16	7.51	3.51	1.82	0.04	3.57
Tail	90.1	90.1	9.86	0.07	2.97	11.1	5.72	0.06	6.71	12.8	15.8	0.03	6.38
<CS1	90.6	90.6	9.92	0.05	2.14	18.0	9.30	0.10	11.3	15.6	19.4	0.07	15.0
Total	913.7	913.7	100.0	0.23	100.0	19.1	100.0	0.09	100.0	7.97	100.0	0.05	100.0
Head				0.24		19.35		0.14		8.31		0.01	

Product	MnO (%)	Dist (%)	SiO2 (%)	Dist (%)	Al2O3 (%)	Dist (%)	S (%)	Dist (%)
>150 Conc	7.61	1.47	7.53	0.05	1.80	0.17	1.43	1.43
Mids 1	3.79	7.81	25.2	1.89	3.25	3.36	0.28	2.98
Mids 2	1.50	6.44	53.5	8.37	4.75	10.2	0.21	4.66
Tail	0.97	13.5	63.9	32.4	4.42	30.8	0.06	4.32
>75 Conc	9.32	2.01	2.29	0.02	4.25	0.46	6.13	6.82
Mids 1	6.31	13.7	5.62	0.44	1.60	1.74	1.24	13.9
Mids 2	3.46	12.6	25.4	3.38	2.84	5.20	0.34	6.42
Tail	1.01	13.4	61.3	29.6	3.87	25.7	0.14	9.59
>CS1 Conc	4.98	0.81	1.35	0.01	2.61	0.21	8.65	7.26
Mids 1	6.10	14.3	4.50	0.38	1.76	2.07	2.48	30.1
Mids 2	2.64	6.07	31.4	2.63	3.04	3.50	0.36	4.28
Tail	0.69	3.78	60.8	12.1	2.35	6.45	0.07	1.98
<CS1	0.74	4.08	43.3	8.69	3.66	10.1	0.22	6.27
Total	1.80	100.0	49.4	100.0	3.59	100.0	0.35	100.0
Head	1.79		48.4		3.26		0.41	

PRODUCT	Wt (%)	Sn (%)	Dist (%)	Cum Dist	Units	Cum Units
>150 Conc	0.94	0.65	4.34	4.34	6.7	6.7
Mids 1	10.07	0.31	22.1	26.5	71.4	78.1
Mids 2	21.0	0.17	25.3	51.7	148.7	226.8
Tail	68.0	0.10	48.3	100.0	482.5	709.3
	100.0	0.14	100.0			

PRODUCT	Wt (%)	Sn (%)	Dist (%)	Cum Dist	Units	Cum Units
>75 Conc	1.12	1.77	10.6	10.6	6.00	6.00
Mids 1	11.3	0.43	26.0	36.6	60.5	66.5
Mids 2	19.0	0.26	26.5	63.1	101.8	168.3
Tail	68.7	0.10	36.9	100.0	369.0	537.3
	100.0	0.19	100.0			

PRODUCT	Wt (%)	Sn (%)	Dist (%)	Cum Dist	Units	Cum Units
>CS1 Conc	1.58	25.7	67.9	67.9	8.48	8.48
Mids 1	22.8	0.50	19.1	87.0	122.5	131.0
Mids 2	22.3	0.18	6.74	93.8	120.1	251.1
Tail	53.3	0.07	6.24	100.0	286.2	537.3
	100.0	0.60	100.0			

